

RECEIVED

MAR 17 2003

TECH CENTER 1600/2900

1600

RAW SEQUENCE LISTING

DATE: 03/12/2003

PATENT APPLICATION: US/09/640,582A

TIME: 08:52:16

Input Set : A:\205970.seq listing.txt

Output Set: N:\CRF4\03122003\I640582A.raw

3 <110> APPLICANT: Forschungszentrum Juelich GmbH
5 <120> TITLE OF INVENTION: Sequences of an Ih ion channel and use thereof
7 <130> FILE REFERENCE: 205970
9 <140> CURRENT APPLICATION NUMBER: 09/640,582A
10 <141> CURRENT FILING DATE: 2000-08-17
12 <150> PRIOR APPLICATION NUMBER: PCT/EP99/00942
13 <151> PRIOR FILING DATE: 1999-02-12
15 <150> PRIOR APPLICATION NUMBER: DE 198 06 581.7
16 <151> PRIOR FILING DATE: 1998-02-17
18 <160> NUMBER OF SEQ ID NOS: 20
20 <170> SOFTWARE: PatentIn Ver. 2.1
22 <210> SEQ ID NO: 1
23 <211> LENGTH: 1342
24 <212> TYPE: DNA
25 <213> ORGANISM: Homo sapiens
27 <220> FEATURE:
28 <221> NAME/KEY: MISC_FEATURE
29 <222> LOCATION: (1308)..(1308)
30 <223> OTHER INFORMATION: "n" may be any nucleotide.
32 <220> FEATURE:
33 <221> NAME/KEY: MISC_FEATURE
34 <222> LOCATION: (1334)..(1334)
35 <223> OTHER INFORMATION: "n" may be any nucleotide.
37 <400> SEQUENCE: 1
38 cggttgcgctt caccaagatc ctcagcctcc tgcggctgct gcgcctctca cgctgatcc 60
39 gctacatcca tcagtgggag gagatcttcc acatgacctg tgacctggcc agcgcggtga 120
40 tgaggatctg caatctcatc agcatgatgc tgctgctctg ccaactgggac ggctgcctgc 180
41 agttcctggt gcccatgctg caggacttcc cgcgcaactg ctgggtgtcc atcaatggca 240
42 tggatgaacca ctctgggagt gaactgtact ccttcgcact cttcaaggcc atgagccaca 300
43 tgctgtgcat cgggtacggc cggcagggcg cggagagcat gacggacatc tggctgacca 360
44 tgctcagcat gattgtgggt gccacctgct acgccaatgt catcgccac gccactgcc 420
45 tcatccagtc gctggactcc tcgcggcgcc agtaccagga gaagtacaag cagggtggagc 480
46 agtacatgtc cttccacaag ctgccagctg acttccgcca gaagatccac gactactatg 540
47 agcaccgtta ccagggcaag atgtttgacg aggacagcat cctgggcgag ctcaacgggc 600
48 ccctgcggga ggagatcgtc aacttcaact gccggaagct ggtggcctcc atgccgctgt 660
49 tcgccaacgc cgaccccaac ttctgcacgg ccatgctgac caagctcaag ttcgaggtct 720
50 tccagccggg tgactacatc atccgcgaag gcaccatcgg gaagaagatg tacttcatcc 780
51 agcacggcgt ggtcagcgtg ctactaagg gcaacaagga gatgaagctg tccgatggct 840
52 cctacttcgg ggagatctgc ctgctcacc ggggcccggc cagggcgagc gtgcgggctg 900
53 acacctactg ccgctctat tcgctgagcg tggacaactt caacgaggtg ctggaggagt 960
54 accccatgat gcggcgcgcc ttcgagacgg tggccatcga ccgcctggac cgcacggca 1020
55 agaagaattc catctcctg cacaagggtc agcatgacct caactcgggc gtattcaaca 1080
56 accaggagaa cgccatcatc caggagatcg tcaagtacga ccgcgagatg gtgcagcagg 1140

ENTERED

RAW SEQUENCE LISTING

DATE: 03/12/2003

PATENT APPLICATION: US/09/640,582A

TIME: 08:52:16

Input Set : A:\205970.seq listing.txt

Output Set: N:\CRF4\03122003\I640582A.raw

```

57 ccgagctggg ctcagecgcgt gggcctcttc ccgcgcgcgc gcgcgcgcgc gcagtcacct 1200
58 cggccatcgc cacgctgcag caggcggcgg ccattgagctt ctgcccgcag tggcgcggcc 1260
W--> 59 gctcgtgggg ccgctggcgc tcggctcgcc ggcctcgtg cgchgcyndy hccccgggsc 1320
60 cgcacctgch gccnccctcac cc 1342
62 <210> SEQ ID NO: 2
63 <211> LENGTH: 3112
64 <212> TYPE: DNA
65 <213> ORGANISM: Rattus rattus
67 <400> SEQUENCE: 2
68 cctggttcgt ggtggacttc atctcctcga tcccgggtgga ttatatcttt cttattgtag 60
69 agaaaggaat ggattcggaa gtttacaaga ccgcagagac acttcggatc gtgaggttta 120
70 caaaaattct cagtctcttg cgtttattac gcctttcaag gtttaattaga tacatacacc 180
71 agtgggaaga gatattccac atgacatatg atctcgccag tgcagtgggtg agaattctca 240
72 acctcattgg catgatgctg ctctgtgtgc actgggatgg ctgtcttcag tttctgggtcc 300
73 cctgtctgca ggacttccca ccggattgct gggtttctct aaatgaaatg gttaatgatt 360
74 catgggggaa acagtatttc tacgcactct tcaaagctat gagtccatg ctgtgcattg 420
75 gttatggcgc ccaggcccc gtcagcatgt ctgacctctg gattaccatg ctgagcatga 480
76 ttgttggggc cacctgctat gccatgtttg tcggccatgc cacagctttg atccagtctc 540
77 tggattcttc aaggaggcag tatcaagaga agtacaagca agtagagcaa tacatgtcat 600
78 tccacaagtt accagctgac atgcgccaga agatacatga ttactatgag caccgatacc 660
79 aaggcaagat ctctgatgag gaaaatatct tcagtgaact taatgatcct ctgagagagg 720
80 aaatagtcaa ctccaactgc cggaaactgg tggccaccat gcctctcttt gctaaccgcg 780
81 atcccaattt cgtgacggcc atgctgagca agctgagatt tgaggtgttc cagcccgagg 840
82 actatatcat tcgagaagga gctgtgggga agaaaatgta tttcatccag catggtgtgg 900
83 ctggtgtcat caccaagtcc agtaaagaaa tgaagttgac agacggctct tactttggag 960
84 aaatatgcct gctgaccaag ggccggcgca ctgccagtgt tcgagctgat acatactgtc 1020
85 gcctttactc cctttcgggtg gacaatttca acgaggtctt ggaggaatat ccaatgatga 1080
86 gaagagcctt tgagacagtt gctattgacc gactagatcg gataggcaag aaaaactcta 1140
87 ttctcctgca gaagttccag aaggatctga acactggtgt tttcaacaac caggagaatg 1200
88 agatcctgaa gcagattgtg aagcatgaca gagagatggt acaagcgatc cctccaatca 1260
89 actatcctca aatgacagcc ctgaattgca catcttcaac caccaccca acgtcgcgca 1320
90 tgaggacca atctccacca gtctacacag cgaccagcct ctctcacagc aacctgcact 1380
91 caccagccc cagcacacag acgcctcaac cctcagccat cctttcaccc tgctcctaca 1440
92 ccacagcagt ctgcagtcct cctatacaga gccccctggc cagcgcgaact ttccattatg 1500
93 cctctccac tgcatcccaa ttgtcactca tgcagcagcc tcagccgcag ctacagcaat 1560
94 ccaggtaca gcagactcag ccgcagccgc agccgcagcc gcagcagccg caacagcaac 1620
95 aacagcagca acagcagcag cagcagcagc agcaacaaca acagcagcag caacagccac 1680
96 agacacctgg tagttccaca ccgaaaaatg aagtgcacaa gagcactcaa gctcttcata 1740
97 acaccaacct gaccagagaa gtcaggcccc tctctgcctc gcagccttcg ctgccccatg 1800
98 aggtctccac tatgatctcc agaccgcac ccactgtggg cgagtccttg gcctccatcc 1860
99 ctcaaccctg ggcaacagtc cacagcactg gccttcaggc agggagcagg agcacctgtc 1920
100 cacagcgtgt caccttggtc agacagatgt cctcgggagc tatttcccc aaccgaggag 1980
101 tgcctccagc acccccacca ccagcagctg tgcagagaga gtctccctca gtcttaaata 2040
102 aagaccaga tgcagaaaaa ccaggttttg cttcgaattt atgattcttg ctgattgtca 2100
103 aagcagaaaa gaaatactct aataaacaga atattctcag atattatttt attctatctc 2160
104 atgatagagc cctatagcct actctaaaaa gatattttag aagctctggc gtacatgcaa 2220
105 atgtaaaaac atatatacat atattattaa atatataat atattctaat gcccaagaga 2280
106 agttcaaaaag acttgtataa ctttcagtgt tatgtcttcc tttctttaa accattaaag 2340
107 gatttaacac attgttgtaa gatcattgat ttctaacctt ttacttaatt cctttgttat 2400

```

RAW SEQUENCE LISTING

DATE: 03/12/2003

PATENT APPLICATION: US/09/640,582A

TIME: 08:52:16

Input Set : A:\205970.seq listing.txt

Output Set: N:\CRF4\03122003\I640582A.raw

```

108 atgtgtttct cctttttatg aagagttctt gaagtcattg gaaacaaaac tctgatttag 2460
109 aaataaaaagg caactccaat tagtttcagc atagcaccaa tcaaagcttt ctttcattaa 2520
110 ctgtgcctct gcatctaggt tgttaattat gtgggattca ataaagaaat cccagtttat 2580
111 agctctaaat tgtatttttg tgcttttaaat tttgagttat gtgaaggaaac acactacacg 2640
112 ctccagccacc ataggagact aacattgccca ctgttaaggc ttcctctaac ctcaaacatg 2700
113 ttcgtcaatt ttgtgaggaa aggtgaggag atatttgtct tcatgtgtta ttggactttt 2760
114 accaagattc agtcaatggt agctgtaaat aacttttcca acctgaataa aagtaactat 2820
115 tctgtgttgt ataaaggtaa aagtcactgt ttaagaattt agttttattg cttcacttca 2880
116 aaagttagag ttttaaaatt tcacaaaaca taataattgt gacaactgtt caaatgtaat 2940
117 gcaattgctt gagacctaca atatcattta aacctgcaat attttatgca aaaattgtat 3000
118 gcttgaacct acaaattgct tgtattacac caaaaatcat tacttttatt ctttcttgac 3060
119 ataatcaagc atctgaacct agtcttgcca tgcttttggg ggcaaaaaaa aa 3112
121 <210> SEQ ID NO: 3
122 <211> LENGTH: 2606
123 <212> TYPE: DNA
124 <213> ORGANISM: Bos taurus
126 <400> SEQUENCE: 3
127 cgggagcccg gagcgcagcc actgagggca gcggcggcgg cgggagcgag gcgcgcagcg 60
128 agaagcggcg gcgaggaatc ggccgggggc ttcgaggacg ccgagggggc ccggcggcag 120
129 tacggcttca tgcagcggca gttcacctcc atgctgcagc ccgggggtcaa caaattctcc 180
130 ctccgcgatg tcgggagcca gaaggcgggt gagaaggagc aggaaagggg taaaactgca 240
131 ggcttctgga ttatccaccc ttacagtgat ttcaggtttt attgggattt aataatgctt 300
132 ataatgatgg ttgaaatct ggtcatcata ccagttggaa tcacattctt tacagaacag 360
133 acaacaacac catggattat tttcaatgtg gcttcagata cagttttcct tttggacttg 420
134 atcatgaatt tcaggactgg gactgtcaat gaagacagtt ctgaaatcat cctggaccct 480
135 aaagtgatca agatgaatta tttaaaaagc tggtttgttg ttgaactcat ctcatcaatc 540
136 ccagtggatt atatctttct cattgtagaa aaaggaatgg attcggaggt ttacaagaca 600
137 gccagggcac ttcgcattgt gaggtttaca aaaattctca gtctcttgcg tttattacga 660
138 ctttcaaggt taattagata catacatcag tgggaagaga ttttccacat gacatatgat 720
139 cttgccagtg ctgtggtgag aatttttaac ctcatggcca tgatgctgct cctgtgccac 780
140 tgggatggct gtcttcagtt cctggtacca ctgctgcagg acttcccacc agattgctgg 840
141 gtgtctctaa atgagatggg taatgattct tggggaaagc agtattccta cgcgctcttc 900
142 aaagcgatga gtcatatgct gtgcattggc tacggagccc aagccccgtg gagcatgtct 960
143 gacctgtgga tcaccatgct gagcatgata gtcggggcca cctgctacgc catgtttgtt 1020
144 ggccacgcca cggctcta attcagtcttg gattcctcaa ggcggaata tcaagagaag 1080
145 tataagcaag tggaacaata catgtcattc cataagttac cagctgatat gcgtcagaag 1140
146 atacatgatt attatgaaca cagataccaa ggcaaaatct ttgatgagga aaatattctc 1200
147 aatgaactca atgacctct gagagaggag atagtcaact tcaactgccg aaaactagt 1260
148 gctacaatgc ctctttttgc taatgcggat cctaatttgc tgaccgccat gctgagcaag 1320
149 ttgagatttg aggtgtttca acctggagat tatatcatac gagaaggagc tgtggctaaa 1380
150 aaaatgtatt tcattcaaca tgggtgttgc ggtgtcatca caaaatccag taaagaaatg 1440
151 aagctgacag atggctcata ctttgagag atttgcttgc tgaccaaggg acggcgcact 1500
152 gccagtgttc gagctgatac atattgtcgt ctttactcac tttctgtgga caatttcaat 1560
153 gaggtcctgg aggaatatcc aatgatgaga agagcctttg agacggttgc cattgaccga 1620
154 ttagatagga tagggaagaa aaattcaatt ctctgcaaaa agttccagaa ggatctgaac 1680
155 acgggtgttt tcaacaatca ggagaacgag atcctgaagc agattgtgaa acacgacagg 1740
156 gaaatggtgc aggaatccc tccctcaat taccctcaaa tgacagccct gaattccacc 1800
157 tcttcaacta ctaccccgac ctctgcctg aggacacagt caccgccagt gtacacagcc 1860
158 accagtctgt ctcatagcaa cctgcactcc cccagcccca gcaccagac ccccgagccg 1920

```

RAW SEQUENCE LISTING

DATE: 03/12/2003

PATENT APPLICATION: US/09/640,582A

TIME: 08:52:16

Input Set : A:\205970.seq listing.txt

Output Set: N:\CRF4\03122003\I640582A.raw

```

159 tcagccatcc tctcgccctg ctctacacc accgctgtct gcagccctcc tgtacagagc 1980
160 ccgctagcca ctcgaaacttt ccactatgcc tccccacgg cttcccagtt gtccctcatt 2040
161 cagcagcagc aggttcagca gccaccgcag cccagcagc caccccaacc tccacagacc 2100
162 cccggcagct ccacaccgaa aaacgaagtg cacaagagca cgcaggcgct tcacaacacc 2160
163 agcctgaccc gagaagtcag gccctctctg gcctcgagc cctcgctgcc ccacgaggtc 2220
164 tccaccctga tctccagacc gcatccact gtgggcgagt ccctggcctc catccctcaa 2280
165 cccgtgacca cgggtccacgg ctcgggcctg caggcagggg gcagggggcac cgtccccag 2340
166 cgagtcaccc tgttccgaca gatgtcatcg ggagccatcc cccccaatcg aggagtcccc 2400
167 cgggcccccc ctccaccagc agccgctcat ccgagggagg cgccctcagt cttaactaca 2460
168 gactcagagg cagaaaagcc acgatttgct tcaaatttat gatcctgctg attgtaaagc 2520
169 agaaagaaat actctaactg aactgaggac gcttctcaga tttgatttta ttctatctcc 2580
170 tgatagatcc tctagcctac tatgaa 2606
172 <210> SEQ ID NO: 4
173 <211> LENGTH: 2986
174 <212> TYPE: DNA
175 <213> ORGANISM: Strongylocentrotus purpuratus
177 <400> SEQUENCE: 4
178 cgggagaata gtgcaccaag ggatgcccg gaaatattaa ttaaagcttt ttaagaacat 60
179 catcaaacc gggcccatc atgaaggaat aacaaggcct tcgaaaagta tgggaaactg 120
180 gtcggcagga catcagcatt attaatctta ggaaactcat tatggataac aaggaaacta 180
181 acggagagct agagcagctt gatgaggccg atccgtccgg tcaaaacctt gatgatgggg 240
182 aaaccgatag caaacaagaa gagaatctca tcaacgttag cccgccaaaa acaccgccag 300
183 gtccctctcc tctctaaag aatggaggaa ggggtcagaa accgccaaa atcccaatat 360
184 gtcataaaaa tggaaagctc cccaagggaag ttgaatggac agaagacaga ggcgaagaca 420
185 gaaaggatag tctcactctt caatcaaagc tagatcacgg ggcatacacg gatgagaaac 480
186 aggatcttct aacatatctt gaccgtcacg gcatcaacag tccagtcaag ctaacaccag 540
187 atgaaactgg agggagcagt gctttggata ttcttgggat tattgaagag agggacaactg 600
188 gtgcactagg ctctgatccc tcatccacta tgcaggccat ggctaaacct gtaggctttc 660
189 tgcagaggca gctatggact gtccctcaac cttcagacaa tagactctcc atgaaacttt 720
190 tcggaagcaa gaaagggtta caaaaggaaa aatctcggct gaggaaggcg ggggttctta 780
191 tcattcatcc atgtatctc ttcatagttt actgggactc actgatgctg tgccatgaca 840
192 tggcaaacgt catcctccta cccgtcgtca ttactttctt ccacaacaag gacatgagta 900
193 cgggttggct catctttaat tgcttctcag ataccttctt cattctcgat ctcatctgca 960
194 actttcggac cggcatcatg aatccgaagt cggccgaaca ggtgatcctc aacccccgtc 1020
195 aaatcgcta tcattatctc cgttcattgt tcatcatcga tctcgtgtct tccatcccc 1080
196 tggactacat ctctctctc gctggcgggc agaaccgtca ctctctcgag gtgtcccag 1140
197 cctcaagat actgcgttt gccaaagctc tcagtcttct tcgactctg cgtctgtcca 1200
198 ggctcatgca gttcgtcagt caatgggaac aggccttcaa cgtagccaat gccgtcatcc 1260
199 ggatctgtaa tctagtgtgt atgatgctt tgattggcca ttggaatggc tgccttcaat 1320
200 atctcgtgcc catgctgcaa gaatacccc accaatcatg ggtcgccatt aatggccttg 1380
201 agcacgtca ttggtgggag cagtatacat gggcactctt caaagccctt tcgcacatgc 1440
202 tctgtatcgg gtacggcaag ttccccctc aaagcatcac cgatgtctgg ctaacgattg 1500
203 tcagtatggg gtccgggtgcg acctgcttcg ccctgttcac cggacacgct accaatctca 1560
204 tccagtccat ggactcctcc agcaggcaat accgtgagaa gttgaaacaa gttgaagagt 1620
205 acatgcagta tcgcaagcta ccgtcccacc tacgaaacaa gatcctcgat tactacgagt 1680
206 accgataccg aggaaagatg tttgatgaga ggcatactct tcgagaagtg tcggagagta 1740
207 tacgacagga tgtcgaaac tacaattgtc gcgacctggg cgcacccgtc cctttcttcg 1800
208 tcggtgccga ctcaaacttc gtcacccgtg tggtgacgct gctcgaattc gaggtcttcc 1860
209 aacccgctga ctatgttata caggaaggtg ctttcggtga tcgcatgttc ttcatccagc 1920

```

RAW SEQUENCE LISTING

DATE: 03/12/2003

PATENT APPLICATION: US/09/640,582A

TIME: 08:52:16

Input Set : A:\205970.seq listing.txt

Output Set: N:\CRF4\03122003\I640582A.raw

```

210 agggcatcgt cgacatcctc atgtccgacg gcgtcatcgc cactgcactc agtgacggct 1980
211 catatcttgg cgaaatctgc ctgcttacct gtgagcgccg cgtggcatcg gtgaagtgcg 2040
212 agacctactg cagctctctc tcgctctccg tccagcattt caaccaagtg ctgcagcagt 2100
213 ttcccgccat gaggaaaacg atggaagaga tagccgttcg tcgtctgacc cgaatcggga 2160
214 aggaatcgag caagctgaaa tcccgccatg agagcccgcg gatcagggac actgcccctc 2220
215 tctttccgat cccacctgat acaccgtctt tcgtcaccga catcgaaaag aaccggttct 2280
216 ttggcgacga caggacgat gtacacatca ggaccgcagt cgacgtcgag cgtgggttcg 2340
217 atgaaaacgt catcgccatc atggatggga gtttatccga cctcaggatg gaaaacgaaa 2400
218 tccaagcccg taaatcgtct agcggaaaac ggaggaaatt ccagcaacaa acaaccgaac 2460
219 tatgacgact tgaaacaaac aatgatggac gcttacaatt tccagtgatt caatacttac 2520
220 gcaatgcaga cattagcttt tgtacctgat tgtttagaat gtattgaatt ttagatcag 2580
221 tccggcaaat aagaaagcat aatttggaaat ttctttcatt gaggaagtac tgaaaacaat 2640
222 gtgatagcag ccggtagaaa ttctctgtcc attatcgagg ctatatcttt cgcgctttct 2700
223 tacgaagtaa atgaaaggat caattaaatt attgttcttt gtctcgtgcg ctttgtatct 2760
224 gatccgaaa aggaatgaaa cgtgattaga acagtaactg attgaactac agaagctctt 2820
225 tcaaatgtt gaatgtatga aggaggagg ggaaggtttg atatatgcaa agaaatggag 2880
226 aaatattttt gtaattttat ctagaatggt actattgatg ctggaaaggt gttgaagttg 2940
227 tccaatattg tgtcaaatca ccaactattt gacatttgtc tttttc 2986
229 <210> SEQ ID NO: 5
230 <211> LENGTH: 3185
231 <212> TYPE: DNA
232 <213> ORGANISM: Drosophila melanogaster
234 <400> SEQUENCE: 5
235 cggaatttcc tcgtgaagg gcaaggggca gagtcagagt caggggcaga gcggcagacg 60
236 ctgcccggcc atcgcggtgc ggtgaggagc gagagtggaa gcgggagcag ccacaccatt 120
237 ccggcgacgg gcaagagtcc gccggtgccg cactcgtctg cggccaagat cagcagctcg 180
238 gcaagcggca gcaagaactg caatttgcct agcgccagca gcaactcatg ccacaagctg 240
239 aacgcccacg cccaaggatc ggagcaggat cgggatcttg gatcgggatc aggatcagga 300
240 ccaccgggac acagtcacta cgcggccgcc tcgcccacaa gctcggtcag cagcaacggt 360
241 catctgaaca agtactgcct caccgacctc acgcgcgcga acgcgagttc aatcgccagc 420
242 tgagcgcgcc caccgactac acgcaccact cctccagcaa cggatcgag caggagggtc 480
243 cctcggaggc caacgagggc caccgaaccg tcggcgagtc caccatcacc gttagccagt 540
244 ccggcgtatc gtatccgcat ccgtactcct atccgtatca ttacggcacc accgctcctc 600
245 ggccacagcg ccggccaatc tcaaggcgtc gctgcagctg cacagctttg ggagccacca 660
246 tccgtgtcct tatccggcaa ggccacgtc cactcgtgc accaacagct tcaaccggcg 720
247 ccacattcgc cggcacaagg gcaagctcgg cgatcgactg ctgagcgggg atagttagga 780
248 atcgggtgcg tgctcctatt gctcgggtgc gaatgcgaac gacaacgacc tgcgcatttc 840
249 gttcgagaac acctgcaccg attcgttggt aaccgctttc gatgatgaag ccctgctaata 900
250 atgcgaccaa ggaaccgaaa tggtagactt tgatgacgtg tcgttgtagc gactccgaa 960
251 agaggagccc atgcccacaa taccgatcgt tcgggaaaaa gtctctgcga atttcctaaa 1020
252 aagtcaattg caatcatggt tccagccgac ggacaaccga ctggccatga aactgttttg 1080
253 cagccgaaaag gcgctggtca aggagcgcgt acgtcagaaa acttccgggc actgggtcat 1140
254 acaccgctgc agttcattca ggttttactg ggacctttgc atgcttttat tattagtagc 1200
255 aaatcttatt atcctgccag tcgcaatatc attcttcaac gatgatctga gcacacgatg 1260
256 gattgccttc aactgcctaa gtgatactat ttttttaata gatattgtag tcaattttag 1320
257 aacaggaatt atgcaacaag acaacgctga acaagtaata ttggatccaa agcttatagc 1380
258 taaacactat ttaagaactt ggttttttct cgatttgatt tcgtcgatac cgctagatta 1440
259 tatattttta attttcaatc aaattatgaa attgcaggat ttctctgatt cttttcaaat 1500
260 attgcatgcc ggacgcgccc tgccgatcct gcgcctggcc aagctgttat ccctggtgcg 1560

```

RAW SEQUENCE LISTING ERROR SUMMARY
PATENT APPLICATION: US/09/640,582A

DATE: 03/12/2003
TIME: 08:52:17

Input Set : A:\205970.seq listing.txt
Output Set: N:\CRF4\03122003\I640582A.raw

Please Note:

Use of n and/or Xaa have been detected in the Sequence Listing. Please review the Sequence Listing to ensure that a corresponding explanation is presented in the <220> to <223> fields of each sequence which presents at least one n or Xaa.

Seq#:1; N Pos. 1308,1334
Seq#:6; N Pos. 1925,1969,1987,1988,2432,2435,2482,2518,2546,2562,2572,2756
Seq#:6; N Pos. 2784
Seq#:8; N Pos. 101
Seq#:10; N Pos. 1119,1120,1126,1412,1464,1684,2357,2760,2761
Seq#:11; N Pos. 4,536,564,621,650,653,661,664,667,668,675,682,689,690,698
Seq#:11; N Pos. 714,719,733,742,746,1290,1293,1306,1326,1340,1349,1358,1387
Seq#:11; N Pos. 1389,1405,1408,1409,1410,1451,1467,1983,2009
Seq#:16; N Pos. 15,24,27
Seq#:17; N Pos. 11,20,23

Invalid <213> Response:

Use of "Artificial" only as "<213> Organism" response is incomplete,
per 1.823(b) of New Sequence Rules. Valid response is Artificial Sequence.

Seq#:19,20

**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ **BLACK BORDERS**
- ☐ **IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**
- ☐ **FADED TEXT OR DRAWING**
- ☐ **BLURRED OR ILLEGIBLE TEXT OR DRAWING**
- ☐ **SKEWED/SLANTED IMAGES**
- ☐ **COLOR OR BLACK AND WHITE PHOTOGRAPHS**
- ☐ **GRAY SCALE DOCUMENTS**
- ☐ **LINES OR MARKS ON ORIGINAL DOCUMENT**
- ☐ **REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**
- ☐ **OTHER:** _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.